

TEACHERS' RETIREMENT BOARD

INVESTMENT COMMITTEE

SUBJECT: External Equity- Report on Enhanced Index Strategy ITEM NUMBER: 9

ATTACHMENT(S): 1

ACTION:

DATE OF MEETING: June 7, 2000

INFORMATION: X

PRESENTER(S): William Mercer Consulting
 Terry Dennison

EXECUTIVE SUMMARY

One of the Investment Branch objectives of the 1999/00 fiscal year was “to explore, evaluate, and present a report on the viability of utilizing long/short domestic equity managers as a portion of the actively managed segment of the domestic equity portfolio”.

One of the styles contained in the actively managed segment of the domestic equity portfolio is an “enhanced index” manager. William Mercer Consulting prepared a report on long/short enhanced equity indexing that has been included as Attachment 1.

Terry Dennison and Patrick Mitchell will be available for questions, if necessary.

An Overview of Long-Short Enhanced Equity Indexing

**California State Teachers Retirement System
Investment Committee
June 7, 2000**

Terry A. Dennison, Principal

Overview

The Long-Short portfolio construction technique can be used to implement an enhanced indexing strategy. By use of Long-Short techniques, the Alpha of an enhanced indexing selection process can be doubled, providing the potential for enhanced value-added for a similar level of tracking error.

The Long-Short techniques involve transaction, settlement, and custody processes considerably more complex than presently used by STRS. The process involves short-selling and the use of derivative securities as well as custody of assets away from State Street Bank.

STRS should consider whether the advantages of the Long-Short technique provide sufficient additional value to justify the additional complexity and risks.

What is Long-Short Investing

Long-short equity investing is not an asset class. Rather, it can be considered a portfolio construction technique. A theoretical long-short, market neutral strategy has no systematic risk. By investing in index futures in an amount equal to the original invested capital, such a strategy also can provide an enhanced indexing strategy.

It is important for STRS to understand the potential costs and benefits of long-short investing in order to make an informed decision about whether to include such strategies in a portfolio. In addition, the mechanics involved in setting up a long-short strategy are significantly more complex than long-only portfolios. A basic knowledge of portfolio construction and the various components of portfolio performance are necessary to properly evaluate and monitor these types of strategies.

Traditionally, investment managers have constructed equity portfolios by taking long positions in stocks that they believe will outperform an equity index benchmark. A method of portfolio construction called long-short equity investing first was introduced to the institutional investor community in the late 1980s. As the name implies, long-short equity managers will take both long positions as well as short positions in stocks.

Assuming the investment manager has a process for ranking the attractiveness of stocks. In a long-only strategy, the manager purchases the stocks that are most attractive in their ranking system. The value-added of that process can be expressed as Alpha, the incremental return over the index. In a long-short strategy, in addition to purchasing the most attractive stocks in their ranking system, the manager sells short the least attractive stocks in their ranking system. In the long-short strategy, the impact of Alpha is doubled. An Alpha is earned for the purchases and a second Alpha is earned for the short sales.

In an enhanced indexing application, the manager could double weight the most the issues in the index and sell short the least attractive issues in the index. The percentage bought and sold-short controls both the Alpha and Tracking Error of the enhanced index. The value added is determined by the ability of the manager's ranking process to identify over- and under-performers. If a small proportion of the index is over- or under-weighted, the Tracking Error with the index is likely to be quite small.

Tax-exempt institutional investors historically had concerns that short sales of securities could create tax liabilities. However, the Internal Revenue Service alleviated these concerns when it issued ruling 95-8 in 1995. The ruling specifically exempted from taxation short sales of publicly traded stock through a broker, making long-short equity investing a viable option for tax-exempt investors.

Building a Long-Short Equity Portfolio

With long-short equity investing, assets are custodied away from the master trust bank and held by a separate custodian called a *prime* broker. Page 7 of the outline provides an example of the steps involved in constructing a long-short portfolio. The example assumes a hypothetical initial investment of \$1,000.

- Step 1: The client deposits \$1,000 with a custodial prime broker. Federal Reserve regulations require that short positions are housed in a margin account with a prime broker.
- Step 2: The investment manager could use this initial investment to collateralize up to \$2,000 of securities positions, \$1,000 long and \$1,000 short. In practice, however, the prime broker retains some of the initial investment, typically about 10% of the invested capital or \$100 in this example, as a liquidity buffer to meet the mark-to-market requirements on the short positions.

- Step 3: The investment manager purchases \$900 in long market positions and these securities are custodied by the prime broker. These securities are the most attractive in its ranking system.
- Step 4: The prime broker arranges to borrow \$900 in securities from a stock lending institution. These securities are the least attractive in the manager's ranking system.
- Step 5: The prime broker sells these securities short and receives \$900 in proceeds.
- Step 6: Upon completion of the sale, the broker provides \$900 in proceeds to the securities lender as collateral for the shares borrowed. Put options are not commonly used in lieu of shorting as put options are not available on all stocks and liquidity is frequently poor.
- Step 7: Broker utilizes a portion of the liquidity buffer to purchase index futures with a notional value equal to the initial investment. The index futures provide a synthetic index fund, generating the return of the underlying index.

The prime broker's role with respect to a long-short portfolio is to find the stocks to borrow for the short sales, clear all transactions, collect and pay out the interest rebate (described in the next section), calculate and pay out dividends owed to the stock lenders, and track the account's compliance with margin and collateral requirements. Investors typically use large established brokers with strong credit ratings when implementing long-short strategies. These brokers also have the best access to securities for short sales.

To equitize a long-short portfolio, the manager would purchase futures contracts providing market exposure equivalent to the initial \$1,000 investment in this example. In addition, the prime broker would require the client to set aside additional proceeds for the margin requirement on the futures contracts. In most instances, the mark-to-market on the long futures will partially offset the mark-to-market on the short stocks.

Components of the Portfolio Return

There are four sources of return in a long-short equity portfolio. The first results from the spread in performance between the stocks that are held long and the stocks that are sold short, i.e. the alpha on the long positions plus the alpha on the short positions.

The second source of return is the interest rebate. When a stock is sold short, the proceeds are used as collateral and deposited in the lender's custody account. The lender's custodian will invest these proceeds in short-term securities. The lender will retain a small portion of the interest earned on the proceeds as a lending fee, and the investor's prime broker will retain a portion to cover expenses and provide some profit. The investor's account will receive the rest. Institutional investors generally can negotiate to receive between 75% and 90% of the income earned by the prime broker on the short sale proceeds. This payment to the investor is referred to as the interest rebate.

The third source of return is the interest on the liquidity buffer. Short positions are marked to market daily and the liquidity buffer serves as a pool for paying and receiving these adjustments. In addition, investors also need to reimburse stock lenders for dividends paid on borrowed stock. Although these payments often can be met from the dividends received on the long positions, the liquidity buffer can serve as a source of funds if the dividends generated by the long positions are not sufficient.

The fourth source of return is from the stock index futures whose performance will closely track the performance of the underlying index.

In practice, if the underlying stocks held in the short portfolio appreciate, the portfolio will incur unrealized losses and marking-to-market will require payments from the liquidity buffer to the lending institution to remain fully collateralized. On the other hand, if the underlying stocks held in the short portfolio depreciate, the portfolio will yield unrealized gains and marking-to-market will generate payments from the lending institution into the liquidity buffer account.

The Effect of the Overall Market Performance on the Long-Short Portfolio

Page 10 of the outline illustrates how the hypothetical long-short portfolio would perform in a bull market. The exhibit assumes that the enhanced indexing process adds 100 basis points of alpha on the long positions and 100 basis points on the short positions. The market as represented by the S&P 500 is assumed to return 20%.

In this scenario, the long positions would generate a return of 21%, 20% of which was the market return and 1% from the manager's alpha. The short positions would generate a loss of 19%, equaling a 20% market loss and a 1% gain from the manager's alpha. The spread between the return on the long and short positions would be $21\% - 19\% = 2\%$, resulting in a net gain of \$18 ($\$900 \times 2\% = \18).

The second component of the total portfolio return is the interest rebate generated on the short positions. The interest rate credited on the proceeds held by the stock lenders is approximately equal to the Treasury-bill rate. In this example, we assumed a rate of 5% which yields a gain from the interest rebate of \$45 ($\$900 \text{ in short proceeds} \times 5\% = \45).

The third component of the portfolio performance is the interest earned on the liquidity buffer held by the prime broker. The interest rate earned is assumed to be the Treasury-bill rate of 5%, yielding a gain of \$3 ($\$60 \times 5\% = \3).

Finally, the index futures are expected to match the market and provide a return of 20%, yielding a gain of \$200. In total, the portfolio generated a gain of $\$18 + \$45 + \$3 + \$200 = \$266$ for a total return of 26.6% on the initial \$1000 investment.

Page 11 of the outline demonstrates how the portfolio would perform in a bear market. We again assume that the enhanced indexing process adds 100 basis points of alpha on the long positions and 100 basis points on the short positions. However, this time the market as represented by the S&P 500 is assumed to return -15%.

In this bear market scenario, the long positions generate a loss of 14% or \$126 ($\$900 \times 14\% = \126) and the short positions generate a gain of 31% or \$144 ($\$900 \times 16\% = \144). The spread between the long and short positions would be $16\% - 14\% = 2\%$, resulting in a net gain of \$18 ($\$900 \times 2\% = \18). The \$45 gain from the interest rebate and the \$5 in interest on the liquidity buffer are identical to the bull market example.

Finally, the index futures are expected to match the market and provide a return of -15%, yielding a loss of \$150. In total, the portfolio generated a loss of $\$18 + \$45 + \$3 - \$150 = \$84$ for a total return of -8.4% on the initial \$1000 investment.

Implementation Issues

At present, all of STRS' assets are custodied with State Street Bank, providing ease of control and reporting. Use of a long-short strategy for enhanced indexing would require a portion of the assets be custodied at the prime broker with reporting to State Street Bank.

Long-short strategies incur some unique explicit costs that should be considered by STRS when evaluating these strategies. These costs include:

- the financial intermediation cost of borrowing stocks to short through a prime broker. This cost runs about 25 to 30 basis points and is assessed by the broker as a haircut on the interest rebate received. These could be mitigated by using STRS effectively lending securities to itself.
- a smaller interest rebate to the investor for securities that are difficult to borrow, such as less liquid, smaller capitalization stocks. As above, STRS may be able to reduce these costs by lending securities to itself.
- incremental trading costs not associated with a long only strategy. Stock exchanges require short sales be made only on an uptick (i.e., at a price higher than the last traded price) or a zero down tick (i.e., at the same price as the last traded price if that price is higher than the previous price). These uptick rules may delay the trading of short positions.
- additional trading costs due to the effective two-to-one leveraging of the portfolio. As illustrated in the example above, with a \$1,000 initial investment, the portfolio had \$900 in long positions and \$900 in short positions for a total invested capital of \$1,800. Therefore, trading costs will be roughly 80% higher than in a long only portfolio. However, a client could restrict a long-short manager to invest only 50%

of the initial capital both long and short so that there is no effective leverage and trading costs will be equivalent to a long-only strategy.

- trading costs incurred to meet the demands of long-short balancing and margin requirements. The values of both the long and short portfolios will change over time depending on the performance of the individual securities. In addition, large market movements may necessitate additional trading in order to avoid margin violations and draw downs on the liquidity buffer.

Clearly, the mechanics involved in setting up and managing a long-short portfolio are more complex than long-only portfolios. To effectively select and monitor long-short investment managers, STRS would need an understanding of these mechanics as well as the unique efficiencies and costs inherent in any long-short strategy.

Benchmarks

As the Long-Short process is adding value over the performance of a synthetic index fund generated by the futures positions, the benchmark for a Long-Short strategy should be an incremental return over the performance of the underlying index.

The incremental return should provide value to cover the additional risks of a long-short strategy such as:

- Failure to meet Alpha targets for the buy- and sell-sides of the Long-Short process
- Tracking Error deviations
- Additional costs associated with short-side operations

Therefore the benchmarks should include an Alpha above that for conventional enhanced indexing as well as a Tracking Error requirement that may be slightly wider than that for more conventional enhanced indexing.

Concerns for STRS

Implementation of a Long-Short strategy requires STRS to sell securities short and utilize derivatives. At various times, these techniques have been considered to involve high risks. Given both the reality and public perception of these risks, it is not clear that sufficient incremental return is available to justify the potential negative public perceptions and the concern for losses in extreme market conditions.

A further issue is that of scale. Given the size of the STRS fund, can a sufficiently large program be run, within both financial and psychological risk tolerances, to have a perceptible impact of STRS' total return performance?

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